



Traditional building stone in Madrid, Spain: the importance of protecting its historical quarries

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The city of Madrid has a significant architectural heritage traditionally built with different types of natural stone from quarries located in the city's near surroundings. The use of this kind of stone has evolved in the course of time, as the stone's extraction technology and cutting made progress. The advance in the transport network also allowed the supply of stone from further quarries, even from different regions.

The location of these quarries is important to be considered for planning the restoration interventions in the built heritage. Such location allows to get the following aspects:

- The supply of stone of the same geological formation, and with the same petrological properties (composition and petrophysics) compatible with the original stone.
- The knowledge of the original quarry stone (before the start of the decay process) makes possible to determine the decay degree of the monumental stones. This would allow to differentiate the damages produced in the course of natural ageing from those originated by other external agents, such as atmospheric pollution. In other words, it makes possible to determine the differential decay of stones located in rural and in urban environments.
- On the basis of the results obtained from accelerated ageing tests, it is also possible to establish alteration indexes and to estimate the useful life evolution of a specific stone.
- These quarry stone specimens – after ageing testing- could be very useful to perform the necessary tests for the selection of the most adequate consolidant and water-repellent treatment.

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· The stone from these historical quarries can be utilised to carry out the accelerated ageing tests and to know the behaviour of the different stone's conservation treatment. This is only useful if the decay processes and the resulted damages are similar in both building and quarry, with the formation of the same alteration products. If not, we should use stone from the building itself.

The location of historical quarries has also an important value under the consideration of historic, socio-economic and industrial knowledge of the cultural heritage of the region. Thus, the protection of these quarries should be done with the same perspective as for the rest of the cultural goods. Under this point of view, the necessary spreading and popularization of this specific heritage should be considered as a preventive measure, allowing society to consider and include them (quarries) as a heritage good, to learn from their historical value and to contribute to their preservation. The development of Geomonumental Routes, showing the monuments and their provenance quarries, is an easy tool to release this unknown heritage.